

WHAT IS CLAIMED IS:

1. A semiconductor device comprising:

stacked semiconductor elements;

5 a resin film formed between the stacked semiconductor elements; and
at least one of a light emitting element and a light receiving element electrically
connected to each of the stacked semiconductor elements,
wherein a signal is transmitted and received between the stacked semiconductor
elements by using the light emitting element and the light receiving element.

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2. A semiconductor device comprising:

stacked semiconductor elements;

a resin film formed between the stacked semiconductor elements;

a metal oxide partially formed between the stacked semiconductor elements; and

15 at least one of a light emitting element and a light receiving element electrically
connected to each of the stacked semiconductor elements,
wherein a signal is transmitted and received between the stacked semiconductor
elements by using the light emitting element and the light receiving element.

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3. A semiconductor device comprising:

stacked semiconductor elements;

a resin film formed between the stacked semiconductor elements;

a light emitting element electrically connected to one of the stacked semiconductor
element; and

25 a light receiving element electrically connected to another one of the stacked
semiconductor element,

wherein a first electric signal is converted to an optical signal in the light emitting
element,

30 wherein the optical signal is converted to a second electric signal in the light receiving
element.

4. A semiconductor device comprising:

stacked semiconductor elements;

a resin film formed between the stacked semiconductor elements;

5 a metal oxide partially formed between the stacked semiconductor elements;

a light emitting element electrically connected to one of the stacked semiconductor elements; and

a light receiving element electrically connected to another one of the stacked semiconductor elements,

10 wherein a first electric signal is converted to an optical signal in the light emitting element,

wherein the optical signal is converted to a second electric signal in the light receiving element.

15 5. A semiconductor device comprising:

semiconductor elements stacked by transferring a semiconductor element formed over a different substrate;

a resin film formed between the stacked semiconductor elements;

20 a light emitting element electrically connected to one of the stacked semiconductor elements; and

a light receiving element electrically connected to another one of the stacked semiconductor elements

wherein a first electric signal is converted to an optical signal in the light emitting element,

25 wherein the optical signal is converted to a second electric signal in the light receiving element.

6. A semiconductor device comprising:

30 semiconductor elements stacked by transferring a semiconductor element formed over a different substrate;

a resin film formed between the stacked semiconductor elements;

a metal oxide partially formed between the stacked semiconductor elements;

a light emitting element electrically connected to one of the stacked semiconductor elements; and

5 a light receiving element electrically connected to another one of the stacked semiconductor elements,

wherein a first electric signal is converted to an optical signal in the light emitting element,

10 wherein the optical signal is converted to a second electric signal in the light receiving element.

7. A semiconductor device formed by detaching a plurality of semiconductor elements each formed over a plurality of substrates and by stacking the detached plurality of semiconductor elements over an element substrate, comprising:

15 a resin film formed between the plurality of stacked semiconductor elements;

a light emitting element electrically connected to one of the plurality of semiconductor elements; and

a light receiving element electrically connected to another one of the plurality of semiconductor elements,

20 wherein a first electric signal is converted to an optical signal in the light emitting element,

wherein the optical signal is converted to a second electric signal in the light receiving element.

25 8. A semiconductor device formed by detaching a plurality of semiconductor elements each formed over a plurality of substrates and by stacking the detached plurality of semiconductor elements over an element substrate, comprising:

a resin film formed between the plurality of stacked semiconductor elements;

30 a metal oxide partially formed between the plurality of stacked semiconductor elements;

a light emitting element electrically connected to one of the plurality of semiconductor elements; and

a light receiving element electrically connected to another one of the plurality of semiconductor elements,

5 wherein a first electric signal is converted to an optical signal in the light emitting element,

wherein the optical signal is converted to a second electric signal in the light receiving element.

10 9. A semiconductor device comprising:

a plurality of stacked thin film integrated circuits attached to each other with a resin;

a light emitting element electrically connected to one of the stacked thin film integrated circuits; and

15 a light receiving element electrically connected to another one of the stacked thin film integrated circuits,

wherein a first electric signal is converted to an optical signal in the light emitting element,

wherein the optical signal is converted to a second electric signal in the light receiving element.

20 10. A semiconductor device comprising:

a plurality of stacked thin film integrated circuits attached to each other with a resin;

a metal oxide partially formed on either surface of each of the stacked thin film integrated circuits;

25 a light emitting element electrically connected to one of the stacked thin film integrated circuits; and

a light receiving element electrically connected to another one of the stacked thin film integrated circuits,

30 wherein a first electric signal is converted to an optical signal in the light emitting element,

wherein the optical signal is converted to a second electric signal in the light receiving element.

5 11. A mobile phone having the semiconductor device according to any one of claims 1 to 10.

12. An electronic book having the semiconductor device according to any one of claims 1 to 10.

10 13. A personal computer having the semiconductor device according to any one of claims 1 to 10.

14. An electronic card having the semiconductor device according to any one of claim 1 to 10.

15 15. A watch card having the semiconductor device according to any one of claim 1 to 10.

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